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Atsushi Suzuki

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7590

05/19/2010

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EXAMINER

HIGGINS, GERARD T

ART UNIT

PAPER NUMBER

1785

NOTIFICATION DATE

DELIVERY MODE

05/19/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

garycohn@seattlepatent.com

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed 03/04/2010 has been entered. Currently claims 1-20 are pending.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

On the Oath and Declaration submitted 04/25/2005 the signed name and the typewritten name for the third named inventor are not in agreement (Yoshio Yoshida vs. Tadashi Yoshida). The Examiner recognizes applicants' remarks to this end, and notes that this objection is being restated until the new Oath and Declaration is submitted.

Claim Rejections - 35 USC § 112

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-6 and 9-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

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which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to claim 1, the Examiner does not find support to state that “the boundary is not lost due to the fusion of the particles” in the specification as originally filed. This rejection will be withdrawn if the phrase is changed to recite “the boundary is not lost due to the fusion of the surfaces.” The fusion of the surfaces is not necessarily the same as the fusion of the particles.

In this instance, the language at page 11, lines 12-15 is the most relevant part of applicants' specification. It states that:

“the surfaces of adjacent polymer particles are in contact with each other or are connected in spots, but the boundary is not lost due to the fusion of the surfaces, and small voids are left in the boundary area between particles.”

Claim Rejections - 35 USC § 102

5. Claims 1, 2, 4, 6, 8, 10, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishida et al. (JP 2002-086905).

The Examiner first notes that the present claims are drafted in product-by-process format. It has been held that “even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product

was made by a different process.” Please see MPEP 2112 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

With regard to claims 1 and 8, Ishida et al. disclose an inkjet recording sheet that may be comprised of a multilayered structure [0069]. This multilayered structure may have a base material, an ink acceptance layer, which reads on applicants' ink absorbing layer, and an upper layer, which reads on applicants' glossy layer [0069]. Any of the layers on the base material may comprise an inorganic particle, which reads on applicants' fine inorganic particles, because any layer may comprise the cationic organic particle, which reads on applicants' non cross-linked styrene-acrylic polymer [0066]. The Examiner deems this because Ishida et al. teach that the inkjet recording sheet may comprise at least one layer containing the cationic organic particles (Abstract). It is clear that the ink acceptance layer and the upper layer may both be the “at least one layer containing the cationic organic particles.” The particle size of the inorganic particles is 5 to 80 nm for a primary particle diameter [0066]. The inorganic particle may be present at 300 weight sections per 100 weight sections of the cationic organic particle in any of the layers [0067]. This therefore teaches that the inorganic particle may be the main component of any layer, including the ink acceptance layer.

The cationic organic particle may be comprised of a copolymer of numerous monomers, including *inter alia* N,N-dimethylaminoethyl methacrylate [0034], which reads on applicants' cationic monomer (see page 10, lines 8-19 of applicants' specification), methyl methacrylate [0036], styrene [0037], and acrylamide [0037]. The

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Examiner clearly envisages forming the cationic organic particles of Ishida et al. from the monomers listed above.

The cationic organic particles are manufactured using emulsion-polymerization [0046], which will result in a polymer dispersion as claimed. This emulsion will then be coated onto the base material [0073].

Ishida et al. teach cationic organic particles, they teach at [0040] that using styrene in the copolymer will result in increased voidage between particles, and they teach the particle sizes of their cationic organic particles at [0027]. All of this evidence combined with the fact that Ishida et al. teach monomers identical to that claimed, lead the Examiner to deem that an upper layer of these cationic organic particles will inherently have surfaces of adjacent polymer particles that are in contact with each other or connected in spots but that are not fused as claimed.

With specific regard to claim 8, the Examiner notes that the sheet may or may not be calendered [0074].

With regard to claim 2, the cationic organic particles may have an average particle diameter of 50-500 nm, which encompasses the claimed range [0027].

With regard to claim 4, the gloss of examples 1-5 of Ishida et al. are each greater than 50% as measured by the 75 degree glossiness [0100]. Given this evidence and the fact that the particles will be comprised of the same monomers as claimed; the Examiner deems that an upper layer comprised of the cationic organic particles set forth above will inherently have a gloss of greater than 50%.

With regard to claim 6, the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

With regard to claim 10, the Examiner has taught claims 2 and 4 above, and therefore the Examiner has taught the limitations of this claim.

With regard to claim 19, the Examiner has taught claims 4 and 6 above, and therefore the Examiner has taught the limitations of this claim.

Claim Rejections - 35 USC § 103

6. Claims 1, 2, 4, 6-8, 10, and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905).

The Examiner first notes that the present claims are drafted in product-by-process format. It has been held that “even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” Please see MPEP 2112 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

With regard to claims 1 and 8, Ishida et al. disclose an inkjet recording sheet that may be comprised of a multilayered structure [0069]. This multilayered structure may have a base material, an ink acceptance layer, which reads on applicants' ink absorbing

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layer, and an upper layer, which reads on applicants' glossy layer [0069]. Any of the layers on the base material may comprise an inorganic particle, which reads on applicants' fine inorganic particles, because any layer may comprise the cationic organic particle, which reads on applicants' non cross-linked styrene-acrylic polymer [0066]. The Examiner deems this because Ishida et al. teach that the inkjet recording sheet may comprise at least one layer containing the cationic organic particles (Abstract). It is clear that the ink acceptance layer and the upper layer may both be the "at least one layer containing the cationic organic particles." The particle size of the inorganic particles is 5 to 80 nm for a primary particle diameter [0066]. The inorganic particle may be present at 300 weight sections per 100 weight sections of the cationic organic particle in any of the layers [0067]. This therefore teaches that the inorganic particle may be the main component of any layer, including the ink acceptance layer.

The cationic organic particle may be comprised of a copolymer of numerous monomers, including *inter alia* N,N-dimethylaminoethyl methacrylate [0034], which reads on applicants' cationic monomer (see page 10, lines 8-19 of applicants' specification), methyl methacrylate [0036], styrene [0037], and acrylamide [0037]. While the Examiner maintains his position of clearly envisaging forming the cationic organic particles of Ishida et al. from the monomer listed above; Ishida et al. do not specifically disclose an embodiment with the four monomers listed above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen any of the copolymerizable monomers of Ishida et al., including the four listed above as claimed, in order to form an inkjet recording sheet

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that had increased voids in between the cationic organic particles and had excellent ink absorbability (see [0040]).

The cationic organic particles are manufactured using emulsion-polymerization [0046], which will result in a polymer dispersion as claimed. This emulsion will then be coated onto the base material [0073].

Ishida et al. teach cationic organic particles, they teach at [0040] that using styrene in the copolymer will result in increased voidage between particles, and they teach the particle sizes of their cationic organic particles at [0027]. All of this evidence combined with the fact that Ishida et al. teach monomers identical to that claimed, lead the Examiner to deem that an upper layer of these cationic organic particles will inherently have surfaces of adjacent polymer particles that are in contact with each other or connected in spots but that are not fused as claimed.

With specific regard to claims 7 and 8, the Examiner notes that the sheet may or may not be calendered, which reads on applicants' machine calendering treatment [0074].

With regard to the temperature of the calendering treatment, it would have been obvious to one having ordinary skill in the art to choose any temperature, including the temperature claimed, as long as it was less than the T_g of the cationic organic particles. If one heated the particles higher than the T_g it would proceed to melt and generate a continuous non-porous film, which would then render the inkjet recording medium unable to absorb ink. This concept is recognized by Ishida et al. at [0077].

With regard to claim 2, the cationic organic particles may have an average particle diameter of 50-500 nm, which encompasses the claimed range [0027].

With regard to claim 4, the gloss of examples 1-5 of Ishida et al. are each greater than 50% as measured by the 75 degree glossiness [0100]. Given this evidence and the fact that the particles will be comprised of the same monomers as claimed; the Examiner deems that an upper layer comprised of the cationic organic particles set forth above will intrinsically have a gloss of greater than 50%.

With regard to claim 6, the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

With regard to claim 10, the Examiner has taught claims 2 and 4 above, and therefore the Examiner deems the limitations of this claim to be intrinsic to the article of Ishida et al.

With regard to claim 19, the Examiner has taught claims 4 and 6 above, and therefore the Examiner has taught the limitations of this claim.

7. Claims 3, 9, 11, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Watanabe et al. (WO 00/15552), of which US 6,632,489 is the national stage entry of the international application, and will be used as a translation.

Ishida et al. disclose all of the limitations of applicants' claims 1 and 2 in section 5 above; however, however, they fail to disclose the type of colloidal silica of claims 3 and 9.

Watanabe et al. disclose rosary (moniliform) shaped spherical colloidal silica, which is comprised of particles having a secondary diameter of 50 to 500 nm (D_1) and a primary diameter of 10 to 80 nm (D_2 , col. 4, lines 7-34). The particles are measured using dynamic light scattering method and BET methods, and typically Watanabe et al. express the particles as a ratio of D_1/D_2 , which represents the amount of linking (coagulation) that occurs (col. 6, lines 16-22).

Since Ishida et al. and Watanabe et al. are both drawn to inkjet recording media; it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the spherical colloidal silica of Watanabe et al. as the inorganic particles of Ishida et al. The results of such a substitution would have been predictable to one having ordinary skill. The motivation for doing so can be found at col. 11, lines 42-49 of Watanabe et al., where they state that ink receiving layer comprised of their inventive silica and a binder will result in increased ink absorption, fast absorption speed, and an improved color development or ink.

With regard to claims 11 and 12, the gloss of examples 1-5 of Ishida et al. are each greater than 50% as measured by the 75 degree glossiness [0100]. Given this evidence and the fact that the particles will be comprised of the same monomers as claimed, the Examiner deems that an upper layer comprised of the cationic organic particles set forth above will intrinsically have a gloss of greater than 50%.

With regard to claim 18, Ishida et al. teach the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

8. Claims 3, 9, 11, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Watanabe et al. (WO 00/15552), of which US 6,632,489 is the national stage entry of the international application, and will be used as a translation.

Ishida et al. rendered obvious all of the limitations of applicants' claims 1 and 2 in section 6 above; however, however, they fail to disclose the type of colloidal silica of claims 3 and 9.

Watanabe et al. disclose rosary (moniliform) shaped spherical colloidal silica, which is comprised of particles having a secondary diameter of 50 to 500 nm (D_1) and a primary diameter of 10 to 80 nm (D_2 , col. 4, lines 7-34). The particles are measured using dynamic light scattering method and BET methods, and typically Watanabe et al. express the particles as a ratio of D_1/D_2 , which represents the amount of linking (coagulation) that occurs (col. 6, lines 16-22).

Since Ishida et al. and Watanabe et al. are both drawn to inkjet recording media; it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the spherical colloidal silica of Watanabe et al. as the inorganic particles of Ishida et al. The results of such a substitution would have been predictable to one having ordinary skill. The motivation for doing so can be found at col.

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11, lines 42-49 of Watanabe et al., where they state that ink receiving layer comprised of their inventive silica and a binder will result in increased ink absorption, fast absorption speed, and an improved color development or ink.

With regard to claims 11 and 12, the gloss of examples 1-5 of Ishida et al. are each greater than 50% as measured by the 75 degree glossiness [0100]. Given this evidence and the fact that the particles will be comprised of the same monomers as claimed, the Examiner deems that an upper layer comprised of the cationic organic particles set forth above will intrinsically have a gloss of greater than 50%.

With regard to claim 18, Ishida et al. teach the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

9. Claims 5, 13, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Graczyk et al. (6,372,329).

With regard to claims 5, 13, and 16, Ishida et al. disclose all of the limitations of applicants' claims 1, 2, and 4 in section 5 above; however, they fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the

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top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Ishida et al. and Graczyk et al. are drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the article of Ishida et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

With regard to claim 20, Ishida et al. teach the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

10. Claims 5, 13, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Graczyk et al. (6,372,329).

With regard to claims 5, 13, and 16, Ishida et al. render obvious all of the limitations of applicants' claims 1, 2, and 4 in section 6 above; however, they fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Ishida et al. and Graczyk et al. are drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the article of Ishida et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

With regard to claim 20, Ishida et al. teach the component (A) of the cationic organic particle copolymer may be from 0.1 to 30% weight percent [0042]. The component (A) is the cationic monomer [0033] to [0035].

11. Claims 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Watanabe et al. (WO 00/15552) as applied to claims 3, 9, and 12 above, and further in view of Graczyk et al. (6,372,329).

With regard to claims 14, 15, and 17, Ishida et al. in view of Watanabe et al. render obvious all of the limitations of applicants' claims 3, 9, and 12 in section 7 above; however, they fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Ishida et al. in view of Watanabe et al. and Graczyk et al. are all drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the article of Ishida et al. in view of Watanabe et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

12. Claims 14, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. (JP 2002-086905) as applied to claims 1 and 2, in view of Watanabe et al. (WO 00/15552) as applied to claims 3, 9, and 12 above, and further in view of Graczyk et al. (6,372,329).

With regard to claims 14, 15, and 17, Ishida et al. in view of Watanabe et al. render obvious all of the limitations of applicants' claims 3, 9, and 12 in section 8 above; however, they fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-

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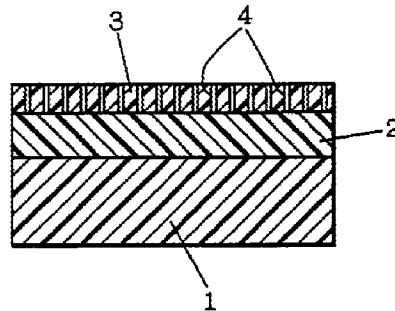
19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Ishida et al. in view of Watanabe et al. and Graczyk et al. are all drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the article of Ishida et al. in view of Watanabe et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

13. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (6,177,181) in view of Watanabe et al. (WO 00/15552), of which US 6,632,489 is the national stage entry of the international application, and will be used as a translation.

With regard to claims 1 and 3, Hamada et al. discloses the device of Figure 1.

FIG. 1



The device comprises a base substrate **1**, an ink-absorbing layer **2**, and a porous top layer (glossy layer) **3** (col. 12, lines 19-25). The recording sheet is especially useful in inkjet recording systems (col. 17, lines 56-60). The porous top layer comprises hydrophilic polymers, which may be the same hydrophilic polymers used in the ink-absorbing layer (col. 16, lines 25-39). Hamada et al. disclose various hydrophilic polymers useful in the ink-absorbing layer that are comprised of copolymerizable monomers at col. 12, lines 1 to col. 13, line 58. They specifically state that the monomers may be used alone or as a combination of two or more at col. 13, lines 16-17 and 56-58. Included in this list of monomers are nitrogen containing cationic monomers (col. 13, lines 6-13) of which N,N-diethylaminoethyl (meth)acrylate at col. 13, line 38 is an example of a nitrogen containing polymer that may be made cationic (additionally please see page 10, lines 8-19 of applicants' specification, which states that N,N-diethylaminoethyl (meth)acrylate is a cationic monomer), (meth)acrylamide at col. 13, lines 40-41, styrene at col. 13, line 51, and methyl methacrylate at col. 13, lines 33-35. The Examiner clearly envisages forming a porous layer out of the hydrophilic polymers listed above.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the porous layer of Hamada et al. out of the hydrophilic polymers listed above. The motivation for using these polymers is to design a porous layer that has high wettability for water-color ink (col. 16, lines 7-11).

The porous top layer is prepared according to the process at col. 11, lines 7-51, which includes placing the polymerized monomers into a "good solvent" and a "poor solvent." These solvent have different affinities for the polymer as they are different polarities. The polymer containing solvent is then coated onto the base and is dried with the "good solvent" coming off first (col. 11, lines 13-22). As the "good solvent" evaporates the polymers form micelles (gel phase), which is equivalent to applicants' polymer dispersion because when dried it will form a dispersion of polymer particles. The dispersion of polymer particles proceeds to form a network structure comprising pores (col. 11, lines 19-22).

Even though there is no disclosure that the porous layer is a glossy layer, given that the composition of the porous layer of Hamada et al. is identical to the presently claimed glossy layer, the Examiner deems that the top layer of Hamada et al. would function as a glossy layer as presently claimed; furthermore, given the fact that the Examiner has shown each of the monomers of applicants' claim 1 are disclosed in Hamada et al., the Examiner deems that the copolymer of Hamada et al. will intrinsically have surfaces of adjacent polymer particles in contact with each other or connected in spots but the surfaces of the adjacent polymer particles will not be fused and voids will be left between the polymer particles as claimed.

With regard to the ink absorbing layer, it may comprise the same hydrophilic polymers for the glossy layer, or it may comprise a simple vinyl alcohol binder (col. 12, line 32 to col. 13, line 58); additionally, it may be comprised of the inorganic particles (pigments) disclosed at col. 15, lines 40-59; however, Hamada et al. fail to disclose the average particle diameter of the inorganic particles in the ink absorbing layer.

Watanabe et al. disclose rosary (moniliform) shaped spherical colloidal silica, which is comprised of particles having a secondary diameter of 50 to 500 nm (D_1) and a primary diameter of 10 to 80 nm (D_2 , col. 4, lines 7-34). The particles are measured using dynamic light scattering method and BET methods, and typically Watanabe et al. express the particles as a ratio of D_1/D_2 , which represents the amount of linking (coagulation) that occurs (col. 6, lines 16-22).

Since Hamada et al. and Watanabe et al. are both drawn to ink receiving layers for inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the pigments of Hamada et al. with the moniliform spherical colloidal silica of Watanabe et al. The results of such a substitution would have been predictable to one having ordinary skill in the art. The motivation for doing so can be found at col. 11, lines 42-49 of Watanabe et al., where they state that ink receiving layer comprised of their inventive silica and a binder will result in increased ink absorption, fast absorption speed, and an improved color development or ink.

With regard to claim 2, Hamada et al. do not explicitly state the particle sizes of their dispersion particles for the glossy layer; however, they do state the pore sizes and

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the transmission of light at 400 nm at col. 16, line 48 to col. 17, line 7. The Examiner deems that these pore sizes would intrinsically represent particle sizes of the polymer dispersions from 100 to 200 nm. The pore sizes of Hamada et al. have a broad range, but a highly transparent porous layer would have a mean pore size of 10 to 350 nm (col. 16, lines 57-62). The sizes of the pores would be directly related to the sizes of the particles and their packing ability. A simple algebraic evaluation of the interstitial area (pore area) of three coplanar adjacent spherical particles led the Examiner to the conclusion that the radius of the particles would intrinsically be $2.2\times$ as big as the diameter of the pore. While only an approximation, it does show that the pore sizes and particles sizes would intrinsically be in the same order of magnitude as each other, and therefore a pore size of 10 to 350 nm would intrinsically comprise a particle size of 100 to 200 nm.

The Examiner has an additional rationale to deem that the particle sizes would intrinsically comprise 100 to 200 nm in the transmission of light at 400 nm. As stated by applicants in their specification (page 14, lines 1-6), a small particle diameter will lead to less scatter at shorter wavelength regions. Since the porous layer of Hamada et al. is highly transparent at 400 nm, the Examiner deems that it must intrinsically be comprised of small particles, including ones of 100 to 200 nm.

With regard to claim 4, since the glossy layer and ink absorbing layer are comprised of the same materials as claimed by applicants, the Examiner deems that the inkjet recording medium of Hamada et al. in view of Watanabe et al. would intrinsically comprise the specular gloss of applicants' claim 4.

With regard to claim 5, the Examiner deems the underlayer of applicants to be a mere duplication of parts of the ink absorbing layer rendered obvious above. It has been held that "mere duplication of parts has no patentable significance unless a new and unexpected result is produced." Please see MPEP 2144.04 and *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). An underlayer comprised of binder and a pigment would function in the same manner as the ink absorbing layer, and therefore would aid the ink absorbing layer in absorbing ink and color-fastness.

With regard to claim 6, the mole fraction of each of the monomers included in the copolymerized glossy layer is disclosed at col. 14, lines 17-23 of Hamada et al. A mole fraction of from 0.1 to 50 mole% would intrinsically encompass 2 % to 30 % by weight; furthermore, it would have been obvious to vary the weight percentage of all the monomers in order to achieve a porous layer that had the proper amount of water resistance and provided the sharpest images.

With regard to claim 9, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2 and 3, and therefore it also renders obvious applicants' claim 9.

With regard to claims 10-12, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2, 3, 4, and 9, and therefore it also renders obvious applicants' claims 10-12.

With regard to claims 13-17, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 2, 3, 4, 5, 9, and 12, and therefore it also renders obvious applicants' claims 13-17.

With regard to claims 18-20, the Examiner has shown that the device of Hamada et al. in view of Watanabe et al. comprises the limitations of applicants' claim 3, 4, 5, and 6, and therefore it also renders obvious applicants' claims 18-20.

With regard to claims 7 and 8, these are product-by-process claims. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." Please see MPEP 2112 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

The Examiner has shown all of the article limitations with regard to these claims in the discussion of claim 1 above; however, the Examiner has not shown that the glossy layer has or has not undergone a calendering treatment. The disclosure of Hamada et al. in view of Watanabe et al. discloses drying the porous layer and does not mention a calendering treatment, which therefore means that the disclosures render obvious applicants' claim 8.

With regard to claim 7, calendering by applicants' own admission (page 2, lines 13-27) is a well-known treatment in inkjet recording media to increase the gloss of paper. It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply any type of calendering treatment to improve the gloss of the inkjet recording medium of Hamada et al. in view of Watanabe et al. The results

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would have been completely predictable to one having ordinary skill in the art of papermaking. With regard to the temperature of the calendering treatment, it would have been obvious to one having ordinary skill in the art to choose any temperature, including the temperature claimed, as long as it was less than the T_g of the thermoplastic latex of the porous layer. If one heated the thermoplastic latex higher than the T_g it would proceed to melt and generate a continuous non-porous film, which would then render the inkjet recording medium unable to absorb ink.

14. Claims 5, 13-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (6,177,181) in view of Watanabe et al. (WO 00/15552) as applied to claims 1-4, 9, and 12 above, and further in view of Graczyk et al. (6,372,329).

With regard to claims 5 and 13-17, Hamada et al. in view of Watanabe et al. render obvious all of the limitations of applicants' claims 1-4, 9, and 12 in section 13 above. Additionally, they disclose the possibility of an ink-receiving layer of synthetic silica and PVA. While the Examiner maintains that the rejection of section 13 above would render obvious applicants' underlayer; the Examiner notes that Hamada et al. in view of Watanabe et al. fail to include a specific reference to an underlayer comprised of synthetic silica and a hydrophilic binder.

Graczyk et al. disclose an inkjet recording medium comprised of two ink receiving layers that have a slightly different binder composition (please note that both binders are still hydrophilic in nature). The reason for doing this is explained at col. 4, lines 6-

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19, wherein the bottom layer is designed to quickly absorb ink vehicle fluids while the top layer is designed to absorb ink while preventing pigmented ink cracks from developing in the images; furthermore, the underlayer can be designed to provide good adhesion of the ink-receiving layers to the substrate. Graczyk et al. also disclose at col. 5, lines 10-29 that the ink-receiving layer may be comprised of ink-absorbing pigments, including synthetic silica.

Since Hamada et al. in view of Watanabe et al. and Graczyk et al. are all drawn to inkjet recording media, it would have been obvious to one having ordinary skill in the art at the time the invention was made to introduce the dual ink-receiving layers of Graczyk et al. as an ink absorbing layer and underlayer in the device of Hamada et al. in view of Watanabe et al. The results of such a combination would have been predictable to one having ordinary skill in the art; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing so was mentioned above and includes a dual layer structure that provides for good adhesion of the ink absorbing layers to the substrate and a structure that quickly absorbs ink vehicle fluids.

With regard to claim 20, the proportion of each of the monomers included in the copolymerized glossy layer is disclosed at col. 14, lines 17-23 of Hamada et al., and includes the range claimed by applicants; furthermore, it would have been obvious to vary each of the proportions of all the monomers in order to achieve a porous layer that had the proper amount of water resistance and provided the sharpest images.

Response to Arguments

15. Applicant's arguments filed 03/04/2010 have been fully considered but they are not persuasive.

Applicants argue with regard to the rejection under 35 USC 102(b) that the nature of the particles depend on the manner in which they are processed, i.e. calendering and temperature.

The Examiner first notes that these limitations are not in claim 1; further, the Examiner did not reject claim 7 under 35 USC 102(b). It is noted that the features upon which applicant relies (i.e., whether the product is calendering and temperatures thereof) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicants argue that the examples of Ishida et al. are close to that of applicants' comparative example 4, which did not contain voids and ink absorption was particularly poor.

The Examiner notes that comparative example 4 is not identical to any of the examples of Ishida et al.; furthermore, the Examiner notes [0077] of Ishida et al. which states that the calendering temperature is chosen specifically so that particles do not deform, voids/interspace spare time are not decreased, and ink absorptivity does not fall. Applicants have not sufficiently shown that the examples of Ishida et al. have a boundary that is lost due to the fusion of the surfaces or that the examples lack voids.

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Given that the teachings of [0077] specifically teach maintaining the shapes of particles, the Examiner deems that the Examples will inherently satisfy the shapes of the particles and the voids as claimed. Applicants need to provide evidence that the examples of Ishida et al. do not possess the particles having fused surfaces. There is no such evidence on record.

Applicants' argue that by using soft calendering at less than 40 °C, "different and better results are obtained."

The Examiner notes that applicants appear to be attempting to argue the presence of unexpected results; however, at this time they are not arguing unexpected results properly. It is noted that "the arguments of counsel cannot take the place of evidence in the record", *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). It is the examiner's position that the arguments provided by the applicant regarding Ishida et al. must be supported by a declaration or affidavit. As set forth in MPEP 716.02(g), "the reason for requiring evidence in a declaration or affidavit form is to obtain the assurances that any statements or representations made are correct, as provided by 35 U.S.C. 24 and 18 U.S.C. 1001".

The Examiner also notes that [0077] of Ishida et al. states that the temperature for calendering should be less than $T_g + 10\text{ }^{\circ}\text{C}$. This is a broad range and includes any temperature less than the T_g , including room temperature to 40 °C as claimed. The Examiner has properly made the argument that it would have been obvious to one having ordinary skill in the art to have made the calendering temperature any temperature within the range cited, including room temperature to 40 °C as claimed, in

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order to result in a layer that had no particle deformation, proper amount of voids/interspace spare time, and ink absorptivity. These factors are recognized by Ishida et al. at [0077].

In each of these ways, applicants' arguments that Ishida et al. fails to teach or render obvious their 4 factors on page 7 of their Remarks is shown to be incorrect, and the Examiner maintains that each of his rejections in this regard is proper.

Applicants argue that Hamada et al. do not form particles.

The Examiner points to col. 4, lines 4-11 which teaches that the micro phase separation structure results in pores formed among particles.

Applicants argue that the Examiner cannot cite a reference that teaches how pore size is related to particle size.

The Examiner derived the relationship of pore size to particle size assuming a 3 particle arrangement, wherein the particles are in a closest packed arrangement. The Examiner has provided his simple algebraic derivation as an attachment. This derivation makes use of commonly known mathematical truths. It shows that pore size and particle size will inherently be on the same order of magnitude, and therefore assuming a system of an average pore size, one of ordinary skill in the art would know that the particle size would be on the same order of magnitude. Given the pore sizes taught by Hamada et al., the Examiner has set forth his *prima facie* case that the particles that provide those pore sizes will intrinsically possess the average particle diameter claimed. Applicants would need to provide evidence in the form of a declaration to show that the particles of Hamada et al. are not the diameters claimed.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is (571)270-3467. The examiner can normally be reached on M-F 10am-8pm est. (Variable one work-at-home day).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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